NON-PUBLIC?: N
ACCESSION #: 9212290197
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Millstone Nuclear Power Station Unit 3 PAGE: 1 OF 03

DOCKET NUMBER: 05000423

TITLE: Reactor Trip Due to Degraded 120 VAC Bus Voltage
EVENT DATE: 11/20/92 LER #: 92-029-00 REPORT DATE: 12/18/92

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Jeffrey S. Young, Engineer, TELEPHONE: (203) 447-1791
Ext. 6442

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

At 0403 on November 20, 1992, with the plant in mode 1 at 100% power, a turbine load rejection transient resulted in a reactor trip followed by a turbine trip.

The turbine control valves closed coincidental with an ElectoHydraulic Control (EHC) trouble alarm and a low voltage alarm on the regulated 120 volt instrument busses. While all events are consistent with the fact that degraded voltage was being supplied to the EHC system, no specific component could be found that caused the degraded voltage. A management review of this condition and actions to minimize impact in the event of recurrence was conducted before startup was authorized. The Auxiliary Feedwater System started due to the low low level in one steam generator. A Feedwater Isolation occured due to low Reactor Coolant System average temperature after the reactor trip. No other Engineered Safety Feature (ESF) signals were initiated or required and the event posed no

significant hazard to the health and safety of the public.

END OF ABSTRACT

I. Description of Event

On November 20, 1992, at 0403 with the plant in mode 1 at 100% power (587 degrees Fahrenheit and 2250 psia) the turbine control valves closed. At the same time, a low voltage condition was reported on the 120 volt bus supplying the control power for the EHC system. A low voltage condition would cause the turbine throttle pressure

limiter to indicate a low steam chest pressure condition and close the valves. As a result of the rapid down power transient, steam generator levels shrank to the low low set point which resulted in a reactor trip followed by a turbine trip.

At the time of the trip, operators verified that the Reactor Trip and Bypass Breakers were open, that all control rods were fully inserted, and that neutron flux was decreasing. An automatic start of the Auxiliary, Feedwater System occurred due to the low steam generator water level. A Feedwater Isolation occurred due to the low Reactor Coolant System average temperature coincident with the reactor trip. These were expected system responses. No additional Engineered Safety Features were required or initiated.

During the transient, both Pressurizer Power Operated Relief Valves (PORVs) cycled open in response to the loss of load. The PORVs were open for less than 5 seconds. The Pressurizer Relief Tank did not experience a significant transient.

II. Cause of Event

Three potential causes were identified but none could be duplicated after extensive investigation and monitoring. While all events are consistent with the fact that degraded voltage was being supplied to the EHC system, no specific component could be found that caused the degraded voltage.

The non-vital 120 volt bus supplies a number of single phase loads. The non-vital 120 volt bus is normally supplied by an inverter powered from a non-vital 480 volt bus. The alternate power supply is a step down transformer off of a different 480 volt bus. An alarm is generated if 120 volt bus voltage reaches 105 volts and a

transfer to the alternate power source occurs at 95 volts. Both of these set points were verified during troubleshooting.

The inverter was investigated as a source of the low voltage, but extensive troubleshooting and subsequent operation of the inverter showed no sign of a continuing problem.

While a low voltage problem is symptomatic of overload condition, no load on the affected phase of the bus showed signs of causing an overcurrent condition.

Because a failed throttle pressure limiter would result in the turbine control valves closing but would not cause a low voltage condition on the bus, the throttle pressure limiter was ruled out as the cause of the transient.

The Throttle Pressure Limiter (TPL) rapidly closes the turbine control valves in response to low steam chest pressure to prevent water induction to the turbine. Rapid closure of turbine control valves caused the Reactor Coolant System high pressure and Steam Generator low level trip. The water induction due to low steam pressure is bounded by a main steam isolation on low steam generator pressure in the Reactor Protection System.

III. Analysis of Event

This event is being reported in accordance with 10CFR50.73(a)(2)(iv) as any event or condition that resulted in automatic actuation of an ESF including the Reactor Protection System. An immediate notification was made in accordance with 10CFR50.72(b)(2)(ii).

All safety systems functioned as designed as a result of the reactor trip. The Auxiliary Feedwater System started automatically due to the low low steam generator water level. A Feedwater Isolation occurred due to the low Reactor Coolant System average temperature coincident with the reactor trip. No other ESF signals were initiated and the event posed no significant hazard to the health and safety of the public. An inspection was performed on equipment that could be affected by the transient; no damage was observed. Secondary plant equipment was returned to normal operation, and the unit was returned to power.

IV. Corrective Action

Disturbance analyzers were set up to monitor and capture voltage transients of the inverter output and the EHC control cabinet power supplies. No transients were recorded during start-up or the two weeks following start-up. The TPL circuit was disabled to prevent a Reactor Trip should a voltage transient occur.

V. Additional Information

No other Licensee Event Reports (LERS) have been submitted for reactor trips resulting from a degraded 120 VAC bus.

This event was reported to the industry.

ATTACHMENT 1 TO 9212290197 PAGE 1 OF 1

NORTHEAST UTILITIES
NU The Connecticut Light And Power Company
Western Massachusetts Electric Company
Holyoke Water Power Company
Northeast Utilities Service Company
Northeast Nuclear Energy Company

General Offices o Selden Street, Berlin Connecticut

P.O. BOX 270
HARTFORD, CONNECTICUT 06141-0270
(203)665-5000

December 18, 1992
MP-92-1337

Re: 10CFR50.73(a)(2)(iv)

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Reference: Facility Operating License No. NPF-49
Docket No. 50-423
Licensee Event Report 92-029-00

Gentlemen:

This letter forwards Licensee Event Report 92-029-00 required to be submitted within thirty (30) days pursuant to 10CFR50.73(a)(2)(iv), any event or condition that resulted in manual or automatic actuation of any

Engineered Safety Feature (ESF), including the Reactor Protection System (RPS).

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

FOR: Stephen E. Scace
Vice President - Millstone Station

BY: Carl H. Clement
Millstone Unit 3 Director

SES/JSY:ljs

Attachment: LER 92-029-00

cc: T. T. Martin, Region I Administrator
P. D. Swetland, Senior Resident Inspector, Millstone Unit Nos. 1, 2 and 3
V. L. Rooney, NRC Project Manager, Millstone Unit No. 3

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